

PAN AFRICA CHRISTIAN UNIVERSITY

BBIT, BSCIT

END OF TERM EXAMINATION

DEPARTMENT: COMPUTING & INFORMATION TECHNOLOGY

COURSE CODE: DICT0132

CAMPUS: ROYSAMBU

COURSE TITLE: PRINCIPLES OF OPERATING SYSTEMS

EXAM DATE: FRIDAY, DATE (6TH DECEMBER 2024)

TIME: START HOUR – END 2:30-5:30 HRS

INSTRUCTIONS

- This exam script has **TWO (2)** sections.
- Read all questions carefully before attempting.
- Answer All questions in Section **A** and any other THREE questions in Section **B**.
- Write only your **student number** on the answer booklet provided.
- None programmable calculators permitted
- Calculators on phones, tablets and computers are NOT permitted in Theory Papers

SECTION A

(Answer ALL questions in this section)

QUESTION 1

- a) Explain **THREE** reasons for employing Batch operating systems **[3Marks]**
- b) When Lewis was using Computer there was a break from the normal sequential processing of instructions in a program. Explain **THREE** causes of breaking of the normal sequencing of instructions **[3Marks]**
- c) Explain **TWO** disadvantages of preemptive scheduling decisions by the operating systems **[4 marks]**

SECTION B

(Answer any THREE (3) questions in this section)

QUESTION 2

- a) Explain many to many multithreading model in operating system **[4 marks]**
- b) Joshua identified **THREE** types of addresses in a program before and after memory was allocated. Discuss **[6 marks]**

QUESTION 3

- a) Consider the various scenarios in which multiple threads may compete for resources, potentially leading to deadlock situations. Describe **THREE** methods for deadlock prevention that you would implement in your application to ensure smooth execution and resource management. **[6 marks]**
- b) Discuss **TWO** major methods of allocating disk space that you would consider implementing to ensure efficient use of resources **[4 marks]**

QUESTION 4

- a) Based on the experience and use of various operating systems by David, discuss **FOUR** threats he may have encountered that affect most of the Operating systems **[8 marks]**
- b) As a software engineer working on a performance-critical application that requires efficient resource management and responsiveness, you need to

understand the distinctions between threads and processes. Differentiate between a thread and a process [2 marks]

QUESTION 5

Consider the following set of processes:

Process	Burst time
P1	8
P2	4
P3	9
P4	5

- a) Explain steps followed to calculate the average waiting time for the non-preemptive Shortest Job First scheduling. [4 Marks]
- b) Daniel want to buy an operating system for his computer, advise him **THREE** major factors he should consider when choosing an operating system [6 marks]

QUESTION 6

- a) Explain in real life the application of the following concepts as used in operating systems [6 marks]
- i). Swapping
 - ii). Segmentation
 - iii). Scheduling
- b) Explore **FOUR** key stages a process goes through during execution in an operating system [4 marks]

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